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PURDUE UNIVERSITY,

LA FAYETTE, IND.

Inaugural Address

BY

PRESIDENT E. E. WHITE.

1876.

INAUGURAL ADDRESS

BY

EMERSON E. WHITE, LL. D.,

PRESIDENT OF PURDUE UNIVERSITY,

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INAUGURAL ADDRESS.

It is less than six weeks since I informally entered upon the duties of the office, now formally and publicly assumed. The time has been much too brief for the work undertaken, and duties which should have commanded a month, have been crowded into a week.

This will be regretted by all who have any knowledge of the number and nature of the questions involved in the management of such an institution as this; but no one can feel so deep a regret as he who bears its responsibility. The duty of the present hour is to call attention to a few of these questions, and to indicate the result of their consideration.

The act of Congress, donating lands to endow colleges "for the benefit of agriculture and the mechanic arts," has proved an educational Babel. No other statute relating to education, has disclosed such a diversity of views, or occasioned such a confusion of ideas. The plans submitted have been sufficiently numerous to bear scattering upon the face of the whole earth!

In the midst of this confusion and conflict of opinion, it is too much to expect that any interpretation of the act will command universal approval. Every person who has given thought to the subject, has an opinion of his own, and, as a rule, the less the thought given, the more positive will be the view entertained. Education is one of those subjects of which few men deem themselves ignorant. A search through a school district will not disclose a person who can not tell

the teacher just how to teach and govern a school. The man who has no personal knowledge whatever of higher education, general or special, is the very one who, at the first brush with the question, will venture to decide just how these land-grant institutions should be managed.

These facts cause me to shrink from the expression of any opinion respecting the object of the grant which endowed, in part, this University, and I certainly should forbear, if a proper interpretation of the act was not the first step in the solution of the problem before us.

It must suffice to say that the act of Congress, referred to, clearly expresses three things. The first is that the grant was intended to endow a "college for the benefit of agriculture and the mechanic arts." The second is that "the *leading* object" of the college, thus endowed, is "to teach such branches of learning as are related to agriculture and the mechanic arts." The third is that this is to be done, "without excluding other scientific and classical studies," and "in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

It is thus seen that the two-fold purpose of the grant was to endow *colleges*—not elementary schools—(1) for the benefit of agriculture and the mechanic arts, and (2) for the promotion of the liberal and practical education of the industrial classes. The one imperative condition is that the teaching of the branches relating to agriculture and the mechanic arts, shall be the *leading* object, and, as a consequence, that the teaching of other branches shall be made a *subordinate* object.

It is unnecessary to make a more exhaustive analysis of the provisions of the act, since it expressly leaves the *manner* in which these two great ends shall be secured, to the several States. Each college is left free to determine for itself how the two classes of studies specified shall be taught, and how the required subordination of one to the other shall be effected. This is the practical question which now confronts us. How shall this University be organized to meet its obligation to the great industrial interests of agriculture

and the mechanic arts? What course of study and instruction will secure the two ends proposed and, at the same time, meet the imperative condition prescribed?

It will assist us in answering these questions if we first settle two other inquiries, which are preliminary and fundamental. What "branches of learning" are related to agriculture and the mechanic arts? Can these branches be made the leading element in the required course of liberal education for the industrial classes?

The branches of learning most directly and closely related to agriculture and the mechanic arts, are the natural and physical sciences, and next to these is the science of mathematics. Inasmuch as the mathematics underlie all the other sciences, as well as every agricultural and mechanical process, the closer relation may be claimed for this science, but no practical error will be made in assigning the natural and physical sciences, with their many applications, the nearest place.

Can these sciences be made a leading element in the "liberal" education demanded for the industrial classes by the act? This will depend on the sense in which the term "liberal" is used. A liberal education is one that includes a knowledge of literature and the sciences generally, and hence there may be two kinds of liberal education. In the one, literature has the leading place and the sciences are subordinate; in the other, the sciences have the leading place, and literature is subordinate. The former is usually called a classical education and the latter a scientific education, the name being determined by the leading element in the course.

It is true that the word liberal, when applied to education, is often used in the narrow sense of classical, but this is not the necessary meaning of the term in the act. It is there used in a more general sense to designate an education that extends beyond the branches relating to the industrial arts, and includes "other scientific and classical studies." A course of higher instruction including the sciences as a leading element, and the languages, literature, and history as a

subordinate element, would certainly afford a liberal education for the industrial classes. Such a course is now provided in the popular "Scientific Course" in Michigan University, in the "Course in Science" in Cornell, and in similar courses in other American colleges. The college that provides such a course of instruction, with the required subordination of the branches, clearly meets the condition imposed by the grant. The education thus furnished is at once an adequate preparation for the study of applied science and a good general preparation for the several pursuits and professions of life.

I have led my audience to this conclusion with some care, for just here arises one of the most serious difficulties that beset the land-grant institutions. It is supposed by some that the terms of the grant require these colleges to teach every branch of learning, and, as a consequence, several of them are making a wide and, may I add, very thin spread of their teaching. They are attempting to do the work of the classical colleges, of schools of science, of polytechnic schools, and, at the same time, to beat about over a large experimental farm. The instruction is cut up into an appalling number of parallel courses, general and special, and the few half-paid professors are used over and over, if not used up.

It is true that there is nothing in the provisions of the grant to prevent an institution, with a limited endowment, from attempting to play university, but there is also nothing that demands such folly. The common-sense view of the grant is that it requires no college, endowed by it, to attempt to do *what it can not do well*. If such a college can do anything to meet its obligation to the industrial classes, it can provide facilities for acquiring a thorough scientific education—at once liberal and practical.

When this is done, the next wise step is to provide instruction in the Applied Sciences, or Technology. The relation of such instruction to all industrial interests is close and fruitful, and the land-grant institution that falls short of this, fails to do what is most needed for the improvement, not only of agriculture and the mechanical arts, but of all industrial

interests and pursuits. It is now conceded that the weak point in the educational system of the West is the absence of schools of Science and Technology. The public schools, academies, and colleges, are supplying facilities for general education, and they are also doing something in the teaching of general science. What is needed, to supplement these, is a few well-endowed and well-equipped institutions, which shall not only teach general science thoroughly, with so much of language and history as may be needed for efficiency and completeness, but which shall carry this instruction in science forward in thorough courses of applied science, the number of such courses being determined by the appliances and resources of the institution. It is better to teach a few applied sciences well than to teach many in a superficial manner.

It is believed that the interests of education would be subserved if the work in all our higher institutions were narrowed to what they can do creditably. It takes no small sum of money to endow a college of literature and general science; it takes much more to endow a college of general and applied science, and it requires an immense sum to equip and run a great university. Too many good academies have been spoiled by an attempt to be colleges, and not a few useful colleges have been spoiled by an ambition to expand into universities.

The opinion is sometimes asserted that a State that has not a broad university is doing little or nothing for higher education. The country, undoubtedly, needs a few first-class universities, but it needs quite as much, if not more, good secondary schools and colleges, *each doing its legitimate, though narrow, work, and doing it well.* The few universities needed are not to be formed by rolling together our present high schools, academies, literary and scientific colleges, and technical and professional schools, but by creating institutions which shall crown and supplement these by worthy courses of more advanced instruction. The university in this country, which is most pretentious in its claims and most depreciatory in its estimate of American colleges, does not give a classical education equal to that of modest Williams, or superior to

that of a score of colleges in the West. Its actual instruction in science and technology does not, to say the least, excel that given by Sheffield, or Stevens, or the Massachusetts Institute of Technology, and it provides few professional courses.

It is easy to overstate the advantages of a mere collection of schools and colleges under the name of a university. A student doubtless derives some benefit from seeing the appliances of different courses of instruction, and by coming in direct contact with a large body of students, representing diverse culture and knowledge; but these, and other advantages not named, may be greatly, if not wholly, offset by unfavorable influences. A student can not study everything in the brief period of four or six years, and, as a rule, he will receive the greatest benefit by taking a well-arranged course and mastering it. The vital thing is thorough and inspiring instruction in the course pursued, and no aggregation of schools, or courses, or professors, or students can take its place or compensate for its absence. What the interests of higher education most imperatively demand, is not so much a consolidation of our schools and colleges as their proper classification and adjustment—the confining of each to the work which it can do creditably and thoroughly with the resources at its command.

Whatever may be true of other institutions, the policy thus indicated is believed to be the true one for Purdue University. Instead of exhausting its limited resources in doing what is now done by the State University, and the classical colleges, it should make the best possible use of its means in meeting the demand for scientific and technical instruction. It must, of course, meet its obligation to provide a liberal education for the industrial classes, but, as already shown, this imposed obligation does not require it to spread over the entire ground of general education. It must be content to begin with the cultivation of a narrow field, and to do its work so well that it may confidently look to the future to widen its domain and fill the import of its university title.

These views and principles have guided in the re-organization now proposed, and they have been embodied as completely as controlling and underlying conditions would admit. The fact has been recognized that while the State of Indiana has an ample number of colleges, it has few preparatory schools where country youth can make necessary preparation for admission to either classical or scientific colleges. Most of the few academies now sustained, either take it for granted that the common schools in the country teach reading and spelling and the other common branches thoroughly, or knowing better, they yield to the foolish desire of pupils, and permit them to leave needed elementary training and enter upon higher studies. The result is that, after a few months of skimming, they are either satisfied with their attainments, or, having lost all interest in their studies, they abandon the effort to obtain a thorough education. The public schools in cities and towns can and ought to do this preparatory work for their own youth, but their admirably graded courses of instruction are poorly adapted to pupils coming from the ungraded country schools. Besides few farmers will be at the expense or will take the risk of sending their children into cities and large towns to prepare for college or special schools.

Whatever may be the explanation, the fact remains that the academies and public schools are sending comparatively few well prepared students to college. Nearly all the colleges of the West find it necessary to sustain preparatory schools, and statistics show that more than half of their students come from the schools thus organized.

These and other considerations have seemed to demand the organization of a preparatory school in connection with this institution. The only alternative suggested is to let the standard of admission down to the low preparation afforded by the country schools, and to this there are serious objections which I will not take time to state. Suffice it to say that so young pupils need the discipline of a school to aid them in acquiring proper habits of study and to prepare them for the liberty of college life.

PLAN OF RE-ORGANIZATION.

Purdue University, as re-organized, will embrace three departments, designated as follows: 1. The University Academy. 2. The College of General Science. 3. Special Schools of Science and Technology.

The Academy will have the two-fold object of preparing students for admission to the College of General Science, and of providing elementary instruction in the sciences for those who can not take a more extended course. Botany, zoölogy, and physics will be taught orally and with special reference to agriculture and the simpler mechanic arts. The Academy will be provided with commodious rooms and other appliances necessary for thorough teaching.

The College of General Science will aim to give a thorough scientific education, first as a general preparation for all industrial pursuits and the duties of citizenship, and secondly as an adequate preparation for the special courses in applied science.

The course of instruction is similar to the "Scientific Course" in several other American colleges, but it devotes more time to the natural and physical sciences, and they will be taught with more reference to the industrial arts. These are the *leading* branches in the course, requiring more than one-third of the student's time for the entire period of four years. Physics and chemistry have each one year, and natural history and geology two years. The course in mathematics includes the branches taught in the best colleges, but more than the usual time is given to the branches below the calculus, which is made an optional study. The course in language is less prominent, but the instruction in English will be made as practical and comprehensive as possible. Every educated person should have a knowledge of at least one language besides his own, and candidates for a degree will be expected to study either Latin or German. The instruction in history will be distributed over the first three years, and it is hoped that it may not only impart some knowledge of the subject, but, what is better, that it may create a taste for historical reading.

The course for the Senior year is largely *elective*. The student who has satisfactorily completed the first three years of the course, is prepared to select intelligently a more advanced course, and to pursue it successfully. Candidates for the degree of bachelor of science may pursue daily, during the senior year, three branches selected from the general course; or they may devote one-half of the time to a special course in applied science, and the other half to branches selected from the general course. This will enable a thorough student to complete any one of the special courses in one year after graduating from the College of General Science.

The general course, thus briefly sketched, is for regular students who desire to take a degree. Students who may wish to pursue special branches, selected from the general course, will be permitted to do so, provided that they are prepared for their perusal in the regular classes.

The University has the necessary appliances and is otherwise prepared to give special courses in Agriculture, Horticulture, Civil Engineering, Physics and Mechanics, Chemistry and Metallurgy, and Natural History. In arranging and announcing the instruction in these Special Schools, care has been taken to keep within the resources and facilities of the University. The instruction offered can be provided.

It is difficult to see how the industrial arts can be more effectively promoted than by the agency of these Special Schools. All of the professions, including the law, medicine, theology and teaching, also the army and the navy and the trade, have each their special schools, whose value and importance were long since settled. They are regarded as necessary and indispensable means of preparation. Do not agriculture and the mechanic arts need similar agencies for their improvement?

It is true that the proposed course in general science will greatly contribute to this end, but something more than this is needed. General science points in the right direction, but applied science is the highway to intelligent skill in all the industrial arts. These arts are, indeed, but applications of science.

It is hoped that the growth of the University in the future may be largely in this direction. Is it too much to expect that the noble gift of Judge Purdue will yet prove a fruitful precedent and that a group of well-endowed special schools, bearing honored names, may eventually make this institution a renowned College of Science and Technology?

SPECIAL INSTRUCTION IN AGRICULTURE.

I have stated that the University is prepared to give special instruction in agriculture. This is true so far as appliances are concerned, but the details of the course are not yet fully arranged. For two years past, two courses in agriculture have been offered, but, for some reason, not a student has completed either course. One or two have taken the modified course in botany and chemistry, and several have assisted, as workmen, in laying out the grounds and in planting trees, vines, and shrubbery, with some incidental instruction. The farm is in sight and the students at all interested in agriculture have doubtless visited it, and thus gained some new ideas of practical farming. All this, it must be confessed, comes far short of what my predecessor and his associates desired and proposed to accomplish, and the result indicates that there is either little demand for special instruction in agriculture or that the right instruction has not been offered.

This whole subject is now under earnest consideration, and it is hoped that plans may soon be devised which will prove more acceptable and successful. To this end it seems desirable to avail ourselves of the experience of the older agricultural schools—to learn what they have actually done in this direction and what are the practical results—to get beneath pretentious courses and plans to the actual work accomplished. It is not a difficult thing to keep up a show of agricultural instruction by means of an experimental farm and paper courses of study, but Purdue University proposes to play no such part. It will aim to meet its obligation to agriculture by practical and effective measures, if such measures can be discovered.

It can teach the science of agriculture and the branches related thereto, as stipulated in the grant, and there is no question respecting the practical value of such instruction. It is a question whether it can well go so far beyond this as *to teach the details of farming by actual practice*. This can only be settled by trial or by an appeal to the experience of other institutions. The practice of the professional schools raises at least a doubt respecting the necessity of such a course. The law schools, for example, teach the principles and practice of law by lectures and books, and the student is sent to the law office and to the courts to learn the practical details of the profession. The polytechnic schools provide systematic practice in teaching certain arts, but, as a rule, the arts thus taught are very unlike farming. The students who enter our agricultural schools, have already had several years' experience on the farm, and are somewhat familiar with its practical details. Whatever may be true of the value of this experience, few intelligent farmers would think of sending a boy from a well-managed farm to an agricultural school to learn the details of practical farming. This would seem much like sending a young lawyer, with several years of actual practice, to a law school to learn the details of his profession.

One thing is evident. If students are to be taught farming by actual practice, this practice must be on a farm which is managed on *business* as well as scientific principles. It is one thing to run a farm with a state treasury to draw upon to pay the bills, and it is quite another so to manage a farm that it may pay for all improvements, and, in addition, support and educate a family. It is questionable whether any style of farming that does not pay expenses, can properly be called practical. It may serve a good purpose as a means of investigation or illustration, but it is certainly a poor way to make a living.

These facts seem to indicate that a farm can not be used both for experiment and for teaching practical farming. Experiment, like experience, is a dear school, and experimental farming is not an exception. For what purpose

shall the fine farm connected with this University be used? Shall it be made a model farm—an illustration of good farming—or shall it be used as an experimental farm? If used for the latter purpose, the experiments must be conducted by a thorough scientific man—a man who is practically familiar with agriculture and all related sciences, and who knows the conditions of an experiment, and the limitations of its results. A superficial empiric in such a position would do the cause of agriculture more harm than good. It would pay the State of Indiana well to employ a first-class scientific man to conduct series of observations and experiments in the interest of agriculture. There is not a shadow of doubt in my mind respecting the great value of such investigations; and they are much needed. But it is a question whether a large farm is required for a laboratory. A field of ten acres would yield about the same results—stock-raising not included—as a farm of two hundred acres, and the cost would be very much less. The necessary variety of soil and climate for reliable results can only be secured by conducting experiments at different points in the State.

I am inclined to the opinion that the best use that can be made of the farm here is to devote say ten acres to experimental agriculture, and as many to horticulture, and to make the rest a model farm—an illustration of farming that is both scientific and profitable. It may be well to afford students daily work on the farm for the purpose of continuing the habit of labor, and also to enable them to earn money to assist in defraying their expenses.

But this subject is too wide for this occasion, and my only object in discussing it is to show that it involves questions which can not be wisely settled in a day or a month. The whole ground needs to be examined and all difficulties duly considered.

Permit me to add, in conclusion, that the present organization of the University is based on the sound educational principle that special preparation for given pursuits should rest up on a general preparation for all pursuits. All pursuits have a common course of instruction, and the mastery

of this common course is the shortest road to a knowledge of those branches which have a special application. Many of the simplest questions of agriculture, for example, require for their solution a comprehensive knowledge of general science, and, besides, the student of agriculture must bring to the task a mind trained to habits of scientific thought and investigation. The superficial empiric, with a little stock of scientific facts in his head, but with no clear insight into their causes and relations, is liable to blunder at every new application of his knowledge. Even practical facts, to be of practical utility, must be applied by an intelligent mind.

Mr. Opie, the great English painter, was once asked by a student with what he mixed his paints to produce such effect in color. "With brains, sir," was the reply—an answer containing the true philosophy of both art and business. The prime fact even in getting a living is *brains*—a mind keen-sighted and far-sighted, and steady in aim and purpose. Thought is the alchemy that has changed plodding toil to many-handed industry, and is making the brain of the laborer stronger than his muscles. Thought has gone out into the harvest field, and the rusty cradle hangs upon the tree, while the reaper, with its stalwart arms, gathers the ripened grain.

It is sometimes urged that every boy's education should be narrowed to those branches that directly relate to his future pursuit or calling. Such an education defeats itself, and, besides, it is only feasible where the occupations of life are inherited and predetermined. In this country, a child is not necessarily born into the occupation of his father. Here the different pursuits stand with open doors, and, as a rule, neither the child nor his parents know which he will enter nor how long he will remain. How few Americans find themselves at forty in the pursuit which gilded their boyish day-dreams at fifteen!

These facts answer an objection to a prescribed course of study. The majority of students come to the beginning of their college course not only ignorant of their aptitude or power, but by no calculation of chances can they foretell

what knowledge they will need in the affairs of life. It is only after a varied trial of their powers in the mastery of representative studies in all the great departments of knowledge, that they find out the studies and pursuits for which they have special taste or fitness. It is one of purposes of general education to disclose to a student his bent and mission.

Moreover, were it possible to groove the education of every youth to his future calling, such a course would not be desirable. "Man does not live by bread alone." The farmer and the mechanic must also be the guide of the family, a member of society, a citizen of the State, the guardian of liberty, and out of these relations flow duties which are the highest concern of education. In educating an American citizen we are not training an English operative or a Chinese coolie. He may be a hewer of wood, but if his life answers life's great end, he will also be a hewer of error and wrong. Every child born into American citizenship is confronted by the grandest political and social problems of earth's history, demanding a breadth of information, a ripeness of judgment, and a catholicity of spirit.

In all our schemes of education, let us not forget that *man* is more important than his work. The engineer must be swifter than his engine, the plowman wider and deeper than his furrow, and the merchant longer than his yard-stick. In education, culture must ever stand before knowledge, and character before artizanship. The highest result of education is manhood.



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